

Center for Scalable Application Development Software

A SciDAC Center for Enabling Technologies

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Executive Summary

Rice University and its partners (Argonne National Laboratory; University of California, Berkeley; University of Tennessee, Knoxville; and University of Wisconsin, Madison) will establish the "Center for Scalable Application Development Software" (CScADS) with the goal of fostering research and development of software tools for increasing the productivity of scientific application development on high-end computer systems. The Center will support three basic activities:

- *Definition of long-term vision for the field through community outreach and vision-building activities.* In particular, the Institute will establish a program of Summer Institutes that would bring together researchers in programming systems and tools for scalable computing with technology consumers—developers of applications, tools and systems—to exchange information, discuss problems, and build a community vision for long-term research and development on software development tools for high-end computing.
- *Research and development of software tools for high-performance computing systems.* The focus of the program of research and graduate education will be to investigate support for programming leadership class computing systems in three dimensions: productivity in application development, scalability from one to many thousands of homogeneous processors, and portability to different computing platforms, including those consisting of heterogeneous processing elements.
- *Development and maintenance of open-source shared software infrastructures.* Such systems make it possible for the research and development community to incrementally construct programming support technologies that are portable across a broad range of high-end computer architectures. A particular focus of this activity will be the Open64 compiler infrastructure that supports a number of projects within DOE.

Future programming systems for high-end computing will not be the product of any single organization. There will be major contributions from academia, industry, national laboratories, and other government agencies. Broad cooperation and coordination among these groups will be vital in order to make steady progress over the long term. It is our intention that CScADS be a nexus of such coordinating activities. The Center will thus collaborate closely with major DOE software and computing resource centers, such as those at Oak Ridge, Argonne, and Lawrence Berkeley National Laboratories, as well as with numerous other SciDAC Centers for Enabling Technologies and Institutes. In addition, it will establish a strong program of interaction with the computing industry.